

UNIVERSITY UNDERGRADUATE STUDENTS' INFORMATION SEEKING BEHAVIOUR: IMPLICATIONS FOR QUALITY IN HIGHER EDUCATION IN AFRICA.

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ABSTRACT

The major purpose of the study was to examine the information seeking behaviour of undergraduate students in the University of Botswana. Specifically, the study made effort to determine the sources consulted and the general pattern of information gathering system by the students: the impact of students' gender, level of study and course of study on the students' information seeking behaviour. The study adopted a descriptive survey design and data was collected using a questionnaire administered to two thousand respondents randomly selected from six faculties in the University of Botswana, Gaborone, Botswana. Major findings from the study include are: first, academic information was rated as the predominant information required by the students, while the Internet was rated the most crucial source of most of the academic information required. It was also found that gender, level of study and course of study significantly influence students' information seeking behaviour ($F = 511.8$, level of signification is .05). However, among the factors, the students' level of study contributed more to the observed variation in information seeking pattern, followed by course of study, while gender had the least influence. The sample was taken in two departments from each of the faculty in the University. This is a typical representation of the population of the undergraduate students of the University of Botswana hence; the findings could be generalized for the whole undergraduate students of the University. The paper is a product of recent survey carried out by the authors; hence the findings reported here are original and reflect the current views and practices of information seeking behaviour of University of Botswana Undergraduates.

Key Word: *Information, Internet, Quality, Higher Education, Information Seeking Behaviour, Botswana, Africa.*

INTRODUCTION

The higher education constituency is growing at a tremendous pace, both within Africa and from outside the continent's borders (Griffin, 2004). Higher education institutions are today recognised by national governments and donors as key agents for social and economic development in view of their inherent capacity to foster knowledge creation, processing and dissemination. According to Ekhaguere (2004), in a study supported by the Ford foundation, countries whose higher education sector is weak and inactive will be continually marginalized in a world whose economy is increasingly globalize and knowledge-driven. Hence, each country tries to improve in the quality of the higher education programmes. However, the developing countries are faced with more challenges in providing quality higher education programme than their counterparts in the developed region.

Many a times when the issue of quality in education, more specifically, quality in higher education is being discussed in Africa, focus have always been on the improvement of resources and facilities and quality of teaching and research. In most of the previous studies on quality in higher education, little or no attention has been paid to the way students in higher institutions organise their learning and its implications for quality. One major organisation that has done a lot of work in Africa is the World Bank. Famous among such interventions of the World Bank is the Nigeria Universities Strategic Improvement Project (NUSIP), other interventions of the Bank in Kenya, Namibia and Zimbabwe, to mention but a few. In all these interventions, focus has been on infrastructural improvements and at best capacity building for staff. In none of these interventions was the students' learning behaviour examined. What all these interventions assumed was that improvement in facilities and teacher quality will automatically result into improved academic achievement of the students.

However, this assumption may seem too simplistic because it is also plausible to argue that even when there are good facilities and quality teachers, students' achievement may still be hampered due to some students factors, principal among which is the way they seek and organise academic information. Hence, the way students organise their learning and search for academic information could be considered very crucial to their overall performance at the end of the day. This situation gets more chaotic, especially when students are given assignments and presentations to make. They need to search for information on their own, consequently it is expected that they consult appropriate sources for academic information.

Inspite of the fact that institutions of higher learning in Africa are generally aware of the impact, if not indispensability of ICT on teaching, learning and research, ICT is still rarely utilized to enrich teaching and learning activities in many universities because of the absence of connectivity in the institutions. According to Ekhaguere (2004) this situation adversely affects the pursuit of higher education studies in these institutions. In

another dimension, even when the connectivity is available, the level of accessibility and utilization is still poorly low. In some institutions, students' access is still generally poor, while only the teachers and support staff use the ICT facilities.

The Problem

This study examined the information seeking behaviour of undergraduate students in the University of Botswana. Precisely, the focus was on obtaining information on the nature of academic information needed by the students, the sources consulted and the general pattern of information gathering system by the students. Furthermore, the study examined the influence of students' gender, level of study and course of study on the pattern of information seeking by the students.

Specifically, the following research questions were addressed in the study:

1. What is the predominant information required by the students?
2. What are the major sources of obtaining academic information in the University?
3. Which are the predominant sources consulted by the students?
4. Will students' gender, course of study, and level of study have any influence on their information seeking behaviour?
5. Do students' get all the information required from the identified sources?
6. How will students rate the general availability and access to information in the University?

LITERATURE REVIEW

Some conceptual framework and the review of several variables that previous researchers have done relevant to undergraduate students information seeking behaviour and review of some model form the theoretical foundation of this study.

The Concept of Information

Uttor (1999) defined information as data value in planning, decision making and evaluation of any programme. He goes further to say that it is a data that have been subjected to some processing functions capable of answering user's query be it recorded, summarized, or simply collected that would help decision making. It is well understood in terms of books, journals, magazines, public and private sector documents of all kinds, whether published for mass circulation or unpublished and restricted or confidential in nature, results of research efforts which are made available to colleagues in form of reports, books articles and non-printed materials. From all these definitions, it is apparent that information is crucial to man's survival. The researcher concluded that information is required in man's daily activities be it in school, play, or work situation

In the cognitive viewpoint of information science (Belkin 1977 cited Eskola, 1998) defined information as associated with a text which is the generator's modified by (purpose, intent, knowledge of recipient's state of knowledge) conceptual structure which underlines the surface structure (e.g. language) of that text. Ingwersen (1995, 1998) subsequently elaborated by defining information as being the result of transformation of the generator's cognitive structures (by intentionality, model of the recipients' state of knowledge, and in the form of signs), and on the other way round information is something, a structure, which when perceived may affect and transform the recipient's state of knowledge (Eskola, 1998). And to Dervin and Nilan (1986: 16) information is seen as something constructed by human beings. In the context of this study, information will be conceived based on the definition of (Eskola, 1998) as something which students need during their studies when they construct meaning about the subjects in the process of learning.

Information Behaviour

Various definitions of information behaviour have been given by researchers. Some defined the term based on the general model of information behaviour developed by (Wilson 1997a: 39), where he posited that a general model of information behaviour needs to include at least three elements: (i) an information need and its drives, i.e. the factors that give rise to an individuals perception of need; (ii) the factors that affect the individuals response to the perception of need; and, (iii) the processes or actions involved in that response. To Taylor (1991: 221-222) information is the product of certain element of the information use environment. The element according to him are: the assumptions, formerly learned or not, made by a defined set of people concerning the nature of their work; the kinds and structure of the problems deemed important and typical by this set of people; the constraints and opportunities of typical environments within which any group or sub-group of this set of people operates and work; and the conscious perhaps unconscious, assumptions made as to what constitutes a solution, or better said, a resolution of problems, and what makes information useful and valuable in their contexts. He concluded based on this definition that information behaviour of different groups of people also is different. On his own, (Thorsteinsdottir, 2001) put forward some other related concept to information behaviour.

He asserted that information behaviour is intertwined concepts which make the concept information behaviour very complex. The concept he gave are:

Information Needs: This is understood in information science as stemming from a vague awareness of something missing and as culminating in locating information that contributes to understanding and meaning (Kuhlthau, 1993). It is an anomalous state of knowledge (Belkin, Brooks and Oddy, 1982), or a gap in individual's knowledge in sense making situations (Dervin and Nilan, 1986). For a person to experience an information need, there must be a motive behind it (Wilson, 1997).

Information Seeking: Ikoja-Odongo and Ocholla (2004) described information seeking as a process that requires an information seeker, or what might be called "personal information structures" such as a person's cognitive abilities, his or her knowledge, skills in relation to the problem or task domain, knowledge and skills specific to a system and knowledge and skills regarding information seeking. Information is undertaken to identify a message that satisfied a perceived need (Wright and Guy, 1997). This activity may be actively or passively done when taking steps to satisfy a felt need (Ikoja-Odongo, 2002). Andersen (2000) in another dimension noted that research on information seeking has looked at how individuals go about finding the materials they need.

Information Seeking Behaviour: This can be described as an individual's way and manner of gathering and sourcing for information for personal use, knowledge updating and development. Faire-Wessels (1990:361 in Kakai et al, 2004) referred to it as the way people search for and utilize information. Kakai et al. (2004) observed that, often students' information seeking behaviour involves active or purposeful information as a result of the need to complete course assignment, prepare for class discussions seminars, workshops, conferences, or write final year research papers. To (Fister, 1992:168) undergraduate students may be smart people, but they are still finding the process of research intimidating. Fister explained that these students do not learn the basic information skills; they only end up using trial and error methods of research. This limits their capabilities to satisfy their needs. Wilson's 1996 model noted that in the process of seeking information, problems are encountered. While Taylor (1990) also noted that after interacting with the information sources (e.g. library) what a user actually needs may not eventually tally with what is practically available, due to constraints either within the stock or due to the user's own inadequacy. Many problems may serve as hindrances for the undergraduates in the process of their search or using the library. These may include library anxiety as asserted by (Mellon, 1986) and users' perceptions of library and its program.

Since this study is conducted in a learning context from students' perspectives, some relevant models are considered:

1. *The Information Search Process Model:* Kuhlthau developed this model by using Belkins (1980) anomalous states of knowledge, Kelly's (1963) phases of construction, and Taylor's (1968) levels of needs as theoretical bases. She defined the information search process as the user's constructive activity finding meaning from information in order to extend his or her state of knowledge on a particular problem or topic. Kuhlthau has conducted empirical studies of students' information seeking behaviour in libraries. Her model includes six stages: Task initiation, Topic Selection, Prefocus Exploration, Focus Formulation, Collection and Presentation. This model deals with three realms common to each stage, namely the affective, the cognitive and the physical. In this six stage model of search process (Kuhlthau, 1994) asserted that information professionals can intervene and help the users to identify as well as solve their information needs depending on where the users are in their seeking process.
2. *Another theory of interest relevant to this present research is Limberg model.* Limberg (1998a, 1998b) quoting Thorsteindottir (2001) posited that content is very crucial to how people seek and use information. Which he said it's contrary to the understanding that information-seeking is a general process which occurs independently of the content in the information. Making reference to the aim of LIS which is to establish a general view of information-seeking restrain the research and limits understanding of the various ways in which people seek information. It was pointed out by Thorsteindottir that if it were accepted that there is more than one type of information process, it would stimulate a deeper understanding of the information seeking process in general within the field. Instead of trying to prove that the information-seeking process can be described with the model, common for different users in different contexts. Thorsteindottir summarized the theory of Limberg by saying that the difference between contexts, situations and groups should be examined and illuminated, not with the purpose of separating groups but to better understand information seeking as phenomenon.

A good number of studies have been conducted which investigated information –seeking and needs of different library users like graduates and undergraduates, academics, researchers and the like (Colinas, 2004). Some of them have tried to distinguish between these categories of users on the basis of their faculty (Brown, 1999; Fidzani, 1998; Hiller, 2002). There are also research studies on library users' studies across a variety of disciplines (Hammond and Mitchel, 1997; Kakai et al.2004; Kamanda, 1999; Zondi, 1992; Whitmire, 2002). Therefore, this review focuses on the studies of undergraduate students and also includes some examinations of other variables before finally narrow it down to the variable which this study is designed to address.

Fidzani (1998) conducted a study in University of Botswana, Gaborone to establish the information needs and information –seeking behaviour of graduate students. Findings include that there was a heavy reliance on library books, textbooks and journals as sources of information used for course-work. The researcher reported further that students primarily relied on scanning the shelves, or browsing through journals rather using the index and abstract databases to locate information. Relevant to this finding (Osiobe, 1988) found that browsing was the most important source of finding references for undergraduate students. He concluded that respondents in the University of Botswana did seek help from University library staff with 40% receiving help from the reference librarian and approximately 32% from the subject librarian. Majid and Ai (2002) studied the use of information resources by computer engineering students in Singapore and found that the top five information resources in order of preference were books,(94%), Lecturers (84%), the internet(86%), and friends (84%). They relied heavily on printed sources of information and their use of electronic journals and databases was very low. While Hartmann (2001) concluded that undergraduate students experienced difficulty in locating items from the library collection and did not understand the processes for retrieving journal articles.

In another study conducted by (Seamans, 2001), it was reported that first year undergraduate students reported that all of the participant felt that they had little need to look for information outside what faculty provided for them in their course and where information was needed. They felt they were able to acquire it using general search engines. Other findings from this research is that student participants were comfortable using technology to learn and that web modules could be used in the future to teach library instruction. Kerins, Madden and Fulton (2004) in another study of graduate engineering students reported that the majority of the students indicated that the Internet was the first source of information they used for a project, and also (Mittermeyer, 2003) reported that many students used the Internet extensively for finding course-related information.

Moreover, Hiller (2002) in a study conducted in the University of Washington reported that undergraduates preferred to visit the library to study rather than to seek journals or books, Similarly, (Seiden, Szmborski and Barbara cited in Callinan, 2004) conducted a focus group study with undergraduate students from Skidmpore college in New York and found that the students had a strong overall preference for digital resources. These preferences were explained to reinforce by a lack of familiarity for printed sources. Wei (1995) observed that undergraduate students in a focus group showed themselves to be inexperienced in online system. They were keen to receive instruction on how to find periodicals, with (58%) and almost half of them wished to receive instruction on using electronic resources in science library.

Having reviewed the various findings of research conducted on various variables influencing or affecting information-seeking behaviour, the next review now focus on the variables investigated in the present study. It was noted earlier in this review that research conducted on library, even here in University of Botswana have shown that undergraduate students do not use most of the library information resources. It may be true that students are experiencing technical problems in accessing information resources; in addition with their lack of basic knowledge and awareness of the resources. Therefore, undergraduate student poor information seeking behaviour was captured and considered the biggest problem to be examined. Apart from the above observation, although a good number of studies have been conducted on information seeking behaviour, but the issue of the influence of gender and subject specialization, particularly in the context of University of Botswana have not been given much consideration. The present study is an attempt in this direction.

Gender and Information Seeking Behaviour

Gender is understood as a social phenomenon with a fundamental social and structural ordering of men and women in the society (Wiklund, 1998). In this relation, men are generally given the preferential right of interpretation, leading to an uneven distribution of resources. These relationships are seen as circumstances in which people have opportunities to act. Description of the academic community according to Wiklund as male research culture belongs here. In this perspective, he considers men and women as not having to act differently, but women have to adjust to structural and cultural conditions where they do not have the same status as men.

Wiklund (1998) again posited that the academic community is a stratified social structure built on competition and a need to be acknowledged. To him, in this environment men and women do not have the same opportunities and one manifestation is that women have difficulties in gaining access to social networks. This is likely to affect women's access to information, particularly information otherwise difficult to get, since that is usually available through informal personal contacts. When studying how men and women find for themselves relevant information, it is interesting to take into consideration differences in access to information (Wiklund, 1998). In a study of highly successful students, (Ford, Miller, and Moss, 2001) found that females tended to experience more difficulty finding information online. It is the focus of this study therefore, to find out whether or not; gender will influence information seeking behaviour of the University of Botswana Undergraduate students.

Subject Specialization and Information Seeking Behaviour

It could be expected that undergraduate students' information-seeking behaviour would differ from faculty and graduate students because their information seeking skills are not as well developed (Whitmore, 2002). However, similar information-seeking pattern could also be expected because undergraduate majors are socialized and indoctrinated into the research process of their academic disciplines through course assignments and lecturers (Whitmore, 2002). This researcher explained further that faculty expose undergraduates' to the major theories and researchers in their field including identifying which journals, authors, books are important and perhaps which databases and academic libraries are useful for seeking information to complete course assignments.

Researchers like (Smart, Feldmann, and Etington, 2000), believe that undergraduates select majors based upon values, interests and characteristics that they share with faculty in the same academic discipline. As Whitmore said, library and information science research has always been interested in examining disciplinary differences (2002). There are students that confirm Whitmore position. Covi (1999) for example analyzed information-seeking behaviour of academic researchers in the field of molecular biology, literacy theory, and computer science and their use of digital libraries. Her result indicated differences in the search strategies employed and the types of material selected among the researchers in the various academic disciplines. Researchers like (Bates, 1996; Broadus, 1987; Watson-Bone, 1994; Wilberly and Jones, 1989) also investigated the information-seeking behaviours of people in the humanities. They generally reported that humanities scholars did not use indexes and abstracts or consult librarians. Kerins, Madden and Fulton (2004), examined the information-seeking patterns of final year undergraduate engineering students split evenly between two engineering institutes in Irish universities.

It was reported that students' engineers seem to have a preference for channels that require the least effort, such as the Internet. They explained that the result was due to the fact that students' engineers viewed the Internet as a speedy, current information source which fed initial information needs quickly. These same authors Kerin et al. (2004) explored information-seeking behaviour among law students focused on the information experiences of Irish University law students. It was reported that most students claimed to use the resources of the library heavily over the course of their academic programmes. Brown (1999) analyzed the information seeking behaviour of physical scientists. She found that those scientists preferred using journal articles, finding new information by attending conferences and through preprints. Her reports further shown that, they preferred electronic access to bibliographic databases, although they favoured obtaining journals articles in print versus electronically. Folster (1995) reviewed social scientist information-seeking patterns and found that they preferred journals instead of other sources, to follow citations instead of using indexes or abstracts to find articles, and they did not view librarians as important sources of information. Finally, Ellis, Cox and Hall (1993) compared the information-seeking patterns of physical and social scientists and found that no essential differences. This is why this study has included all these factors in analysing the pattern of information seeking behaviour of University of Botswana undergraduate students.

METHODOLOGY

This is essentially a survey study. Two thousand undergraduate students randomly selected from across the six faculties in the University of Botswana constituted the sample for the study. Two departments were selected from each faculty, yielding a total of twelve departments, and from each of these departments the lists of students were obtained and using a proportional to size sampling technique, the sample size of 2000 was generated. A questionnaire tagged "Undergraduate Students' Academic Information Seeking Behaviour Scale (USAISBS) was used to collect data for the study. Examples of items contained in the questionnaire are:

1. Which of the following do you use last to research a problem? :
 - a. the library. b. the Internet. c. the books etc.

2. Which of the following do you use to obtain information for your academic work?
 a. the library. b .the Internet. c journals

The questionnaire had a total of twenty items and was validated using both internal and external validity procedures, with a reliability coefficient of 0.92 using the cronbach alpha.(A sample of the questionnaire is attached). The questionnaires were administered to the sample in their respective classrooms to reduce the mortality rate. On the whole, two thousand completed cases were used for data analysis. Data collected was analysed using descriptive statistics of frequency and percentages, also Multiple Regression were employed to analyse data across and within groups.

RESULTS

The results of the analyses obtained are presented as follows:

Research Question 1

What are the predominant information required by the students?

Table 1. Predominant Information Required by the Students.

Required Information	Frequency	Percentage
Health Information	225	11.25
Information for personal development.	250	12.5
Academic Information	1282	64.1
Employment Information	186	9.3
Global Information	57	2.85
Total	2000	100

In Table 1 above, the results show that the predominant information required by students is academic information. This is confirmed with 1282 students 64.1%. Other required information by the students but which may not be as vital as academic information are: information for personal development; health information; employment information and global information.

Research Question 2

What are the major sources of obtaining academic information in the University?

Table 2. Major Sources of Academic Information

Sources of Information	Frequency	Percentage	Rank
Lecture Notes & Handout	312	15.6	2
School Library	129	6.4	3
Internet	1089	54.4	1
Consulting and photocopy colleagues notes	50	2.5	8
University Bookshop	29	1.4	10
Textbooks	97	4.9	4
Thesis/Dissertations	85	4.3	5
Newspaper	79	4.0	6
CD-ROMs Database	42	2.1	9
Print Journals	20	1.0	11
Electronic Resources	68	3.4	7
Total	2000	100	

The results in table 2 above show the eleven major sources of obtaining information by the students.

Research Question 3

Which are the predominant sources consulted by the students?

The same Table 2 above provide answer to this question. The result as reveals from the table show Internet as the most consulted source by the students. This is confirmed by the overwhelming majority of the participants 1089 (54.4%). Next to it is the Students Lecture Notes and Handouts with 312 (15.6%). School Library was rated as the third source of information most consulted by the students. Other sources indicated are: Textbooks 97

(4.3%); Newspaper 79 (4%); Electronic Resources 68 (3.4%); Consulting/Photocopying of Colleagues Notes 50 (2.5%); CD-ROMs Database 42 (2.1%) and Print Journal 20 (1%).

Research Question 4

Will students' gender, course of study, and level of study have any influence on their information seeking behaviour?

Table 3. Stepwise Multiple Regression Analysis on the Influence of Gender, Course of Study, and Level of Study on Information Seeking.

Standard error of the estimate = 8.500				
Multiple R adjusted = 0.6237				
R2 (adjusted) = 0.522				
Analysis of Variance				
Source of variation	Suns of Squares	df	Mean Square	F.Obs.
Regression	9443.70	3	4721.9	511.8
Residual	18,426.27	1996	9.227	
Total	127869.97	1999		

Table 3 above provides a summary of the results of the multiple regression analysis for the influence of gender, course of study and level of study on the information seeking behaviour of the participants. The result reveals that all these variables significantly influence students' information seeking behaviour. This is because all the factors jointly exert 52% influence on student information seeking pattern.

Table 4. Descriptive Statistics and Intercorrelations among the variables

Variables	No	Mean	S.D	Info.Seeking	Gender	Course of study	Level of Study
Infor.Seeking	1999	50.86	11.6	1.0000			
Gender	1999	20.62	5.1	.2122**	1.0000		
Course of Study	1999	28.14	7.9	.3416**	-.2011*	1.0000	
Level of Study	1999	30.07	8.4	.3911**	-.1076*	-.2600*	1.0000

N= 1999, correlation greater than .2 are significant at **P<.001.

To determine the extent to which each of the three factors (variables) influenced the information seeking of the students, the test of the significance of the estimated parameters in the regression model was carried out and findings presented in table 5.

Table 5. Relative Extent of influence of the factors on Information Seeking

Model	B	Standard Error	Beta	T-Value	P
Constant	25.623	8.327		8.71	<.001
Gender	.063	.081	.116	3.22*	<.001
Course of study	.119	.126	.141	3.68*	<.001
Level of study	.235	.221	.337	4.91*	<.001

The Table 5 above shows that each of the factors had a significant influence on students' information seeking behaviour. Level of study had the most significant influence (Beta = .337; t = 4.91; P< .001). Course of study is the next with (Beta = .141; t = 3.68, P<.001) It can be infer from these results as well that differences exists in the information seeking behaviour of the participants based on gender, course of study and level of study. This is shown by the variation in the Value of T obtain on each of them.

Research Question 5.

Do students get all the information required from the identified sources?

Table 6. Getting Required Information from Identified sources

Item	YES	%	NO	%
I get all the information I need from the sources identified	1235	(61.8)	765	(38.2)
All the sources identified are very rich because I always get what I want from them at once.	1468	(73.4)	532	(26.6)

Table 6 above reveals that a majority of the participants confirmed that they get the required information from the identified sources. To get more detail on this, participants were asked to indicate their level of satisfaction with getting required information from these identified sources. The next table contain the detail.

Table 7. Level of Satisfaction of Information Obtained.

Response	Frequency	Percentage
Very Satisfied	1200	60
Satisfied	426	21.3
Less Satisfied	300	15
Dissatisfied	74	3.7
Total	2000	100

Table 7 above gave a complementary result to what obtain in table 6. The results confirm that 1200 participants (60%) who constitute the majority indicated they are very satisfied with all the information they are getting from the identified sources. Furthermore, 426(21.3%) indicated they were satisfied while 300 (15% and 74 (3.7 %) indicated less satisfied and dissatisfied respectively.

Research Question 6.

How will students rate the general availability and access to information in the university?

Table 8. Rating of Accessibility of Information in the University

Level of Accessibility	Frequency	Percentage
Highly Accessible	918	45.9
Accessible	515	25.7
Slightly Accessible	374	18.7
Inaccessible	193	9.7
Total	2000	100

Table 8 above indicates the participants' rating of the accessibility to information in the University. The result show that 918 (45.9%) indicated the information were highly accessible; 515 (25.7%) indicated the information were accessible and 374 (18.7%) indicated the information in the University were slightly accessible. To infer from these result, it is generally clear that information is generally accessible to students in the University.

DISCUSSION

Major challenges facing most tertiary institutions in Africa is the provision of infrastructural facilities, especially academic support facilities such as the Internet connectivity (Igun, 2005). However, beyond the problem of facilities is the way students organise their own learning, how they sourced for the academic information needed for them to excel. In addressing the issue of quality in Africa higher education institutions, therefore, a more holistic approach needed to be adopted, rather than the isolationist, fragmented tendencies. The students who are the direct beneficiaries and users of these facilities must be factored into the quality issues. Hence, this study provides some useful insights into the way students organise their own learning and how this could help in promoting quality in higher education in the continent.

Information gathering could be a challenging and an arduous task to the tertiary institutions students in Africa. These students are loaded with many assignments and class presentations which required they source for information on their own in an environment that seem academically unfriendly, in terms of limited sources. As shown from this study, the Internet provides the most consulted sources among the plethora of sources listed in this study. It is striking to note that students in this particular University have access to the Internet facilities, and they utilize same for their learning. This seemingly growing dependence on the Internet by undergraduate students in an African university therefore calls for urgent actions in the provision of the facilities. It is however strange to find out that the students rated the University library as the third most consulted sources, after Internet

and Instructors lecture notes. This is perhaps strange because the University of Botswana Library is rated among the best in Africa universities in terms of size and volume (Ojedokun and Owolabi, 2003). It may be postulated that students actually find it easier to locate materials on the internet than searching through the library, a task which may seem laborious. The use of the internet by a majority of the students as reported in this paper was contrary to the findings of Fidzani (1998), when he reported that there was a heavy reliance on library books and journals. This perhaps is a positive indication that the University of Botswana has progressed positively from the traditional library dependent University to the more virtual library-based University. It may also be reasoned that perhaps, appropriate library education programme need to be put in place to assist the students further in accessing library information. This is not restricted to our sample; this would be assumed for students in other tertiary institutions, especially in Africa. The expectation is that when students are fully informed about the potential of the libraries, they will make use of them more.

More importantly, the findings with regard to Internet usage provide a big challenge to Africa universities. If quality in higher education is to be attained in Africa, a more radical and positive approach to the provision of Internet facilities in our tertiary institutions must be adopted. Presently, even in those universities where Internet facilities are available, there is still a limitation in terms of access to the students. In most instances, access of Internet to students is still largely minimal, even here in the University of Botswana (Ojedokun and Owolabi, 2003).

Hence, in a majority of higher institutions across Africa, students are forced to patronise the private internet service providers popularly known as cyber cafes. To stem this tide and to ease the problems faced by students in terms of access to Internet, direct investment in its provision must be given ultimate priority. This will be a big challenge to most African governments that are groaning under the hardship of poor economies. It therefore calls for the intervention of international donor agencies and foreign governments to salvage African higher institutions from its present predicaments.

The study further determined the interactive influence of gender, course of study and level of study on the information seeking behaviour of students. Findings from the study show that whereas all these three factors significantly influenced the way students search for academic information, however, the level of study of students contributed most to the observed significance. One may postulate that the higher the students go on the academic ladder, the more academic information they required to tackle the various challenges. At a more higher stage, students tends to be given opportunities to organise their own learning, more assignments and projects are given that will require them to search for information. More specifically, those thesis and projects will require them to surf the Internet more frequently. Hence, it is gratifying to note that the level of study is a key factor in information seeking behaviour of higher institution students.

On the level of accessibility of information, our sample indicated that academic information is accessible and they are satisfied with the information facilities provided by the university. Positive as this may seem, this findings could not hold for a majority of tertiary institutions in Africa. As pointed out earlier on, the University of Botswana, where this study was carried out has invested a lot into information technology for teaching and learning, unlike most comparable institutions in Africa. As reported by Ekhaguere (2004) most of the universities in Nigeria for example lacked Internet connectivity. Perhaps, it should be stressed to that even within the University of Botswana, where the Internet facilities are available, as large as 38.2% of the students indicated that they could not get all the information required for their academic work. Also about 28.4% of the students indicated that they were not satisfied by the level of information they are getting from the internet services.

While it may be plausible to argue that a majority of the sample indicated positive responses on most of the parameters examined, it may be dangerous to dismiss the percentage that are not getting access. It therefore seem that more facilities are still needed, especially, the provision of more computers for students' use. It has been previously observed that students are not getting adequate access to computers in this university (Ojedokun, 2001). The finding in this study has therefore reinforced the earlier observation; hence the urgent need to address this inadequacy.

CONCLUSION

The issue of quality in higher education in Africa has become more paramount now, with the release of the results of the ratings of world universities in 2005, which shows that only a negligible few (not up to 1%) of universities in Africa was ranked among the first 500 universities in the world. This issue poses a serious challenge to African universities. In tackling the problem of quality therefore, it is imperative that the provision of information technology should be the nucleus of the strategies for improving quality. Students in tertiary institutions need information for their academic activities and this can not be taken for granted. A well

articulated and sustained effort is required to provide ICT facilities in African universities and make the same more accessible to the students.

REFERENCES

- Bates, M.J. (1996).The Getty end-user online searching project in the humanities: Report No 6: Overview and conclusions. *College and Research Libraries*, 57, 514-523.
- Belkin, N.J Oddy, R. & Brooks, H. (1982). Information retrieval: Pt. 1 Background theory. *Journal of Documentation* 38(2), 61-71.
- Best, J. W. & Kahn, J. V. (1998). Research methods in education. Englewood Cliffs N.J: Prentice-Hall.
- Broadus, R.N. (1987).Information needs of humanities scholars: A study of requests made at the National Humanities Center. *Library and Information Science Research*, 9113-129.
- Brown, C.M. (1999).Information-seeking behaviour of scientists in the electronic information age: astronomers, chemists, mathematicians, and physicists. *Journal of the American Society for Information Science* 50 (10), 925-943.
- Callinan, J.E. (2004).Information-seeking behaviour of undergraduate biology students: A comparative analysis of first year and final year students in University of College Dublin. *Library Review*, 54, (2) 86-99.
- Clougherty, L. (1998).The University of Iowa Libraries' undergraduate user needs assessment. *College and Research Libraries* 59, (6), 572-584.
- Covi, L.M. (1999).Material mastery: Situation digital library use in university research practices. *Information Processing and Management* 35, 293-316.
- Dervin, B. & Nilan. (1986).Information needs and users. *Annual Review of Information Science and Technology*, 21: 3-33.
- Ellis, D., Cox, D& Hall, K.(1993). A comparison of information-seeking patterns of researchers in the physical and social sciences. *Journal of Documentation* 49, 356- 369.
- Eskola, E.L. (1998).University students; information seeking in a changing learning environment- How are students' information needs, seeking and use affected by new Teaching methods? *Information Research* 4 (2). Available at: <http://www.shel.ac.uk/~is/publication/infres/isic/eeskola.html> (access on 10th February, 2006).
- Fidzani, B.T. (1998).Information needs and information-seeking behaviour of graduate students at the University of Botswana. *Library Review* 47(7), 329-340.
- Fister, B. (1992).The research process of undergraduate students. *Journal of Academic librarianship*, 18 (3), pp 163-169.
- Folster, M.B (1995).Information-seeking patterns: Social sciences. *The Reference Librarian*, 49/50, 83-93.
- Ford, N., Miller, D., & Moss, N. (2001).The role of individual differences in Internet searching: an empirical study. *Journal of the American Society for information Science and Technology* 52 912), 1049-1066.
- Hammond, C. & Mitchell, E. (1997).Library instruction for the professions: information needs and Libraries. *Reference Services Review* 25 (2) 79-86.
- Hartmann, E. (2001).Understanding of information literacy: the perception of first year undergraduate students at the University of Ballarat. *Australian Academic and Research Libraries* 32, (2), 35-43.
- Hillers, S. (2002).How different are they? A comparison by academic area of library use, priorities and information needs at the University of Washington, *Issues in Science and Technology Librarianship*, Vol.33, available at: [http:// www.ist.org/02-winter/article.html](http://www.ist.org/02-winter/article.html) (access 10 February, 2006).
- Igun, S.E. (2005) .Users and Internet skills: A report from Delta state University, Abraka, Nigeria. *Electronic Journal of Academic and Special Librarianship* 6 (3), 1-9.
- Ikoja-Odongo, R & Ocholla, D.N. (2004).Information-seeking behaviour of the informal sector entrepreneurs: The Uganda Experience. *Libri* 54, pp. 54-66.
- Ikoja-Odongo, R. (2002).A study of the information needs and uses of the informal sector of Uganda. University of Zululand, South Africa (Unpublished PhD thesis).
- Ikoja-Odongo, R & Ocholla, D.N. (2003).Information behaviour of Fisher folk in Uganda. *International Library and information Research*. 25(1), 89-105.
- Ingwersen, P, & Borlund, P. (1996).Information transfer view as interactive cognitive process. In Ingwersen P. and N.E Pors (Editors), *Information Science interaction in perspective*. Copenhagen, DK. *The royal School of Librarianship*, 219-232.
- Ingwersen, P. (1995).Information and information science. In: Allen Kent (ed.).*Encyclopaedia of Library and Information Science*. 56. 19. New York: Marcel Dekker. 137-174.
- Kakai, M., Ikoja-Odongo, R. & Kigongo-Bukeny, I.M.N. (2004).A study of the information seeking behaviour of undergraduate students of Makerere University, Uganda. *World Libraries*, 14(1), 544 -564.
- Kamanda, R.W. (1999).Library-use by university students: Case study of the East African School of Library and Information Science. Kampala: Makerere University Unpublished DLS dissertation.

- Kahlthau, C.C. (1994). Seeking meaning: A process approach to library and information services... Norwood, NJ: Ablex Publishing
- Keelhaul, C. (1993). Seeking meaning. A process approach to library and information services. Norwood, NJ: Ablex.
- Kelly, G. (1963). A theory of personality: The psychology of personal constructs. New York: Norton.
- Kerins, G., Madden, R., & Fulton, C. (2004). Information-seeking and the students studying for professional careers: the case of engineering and law students in Ireland. *Information Research* 10 (1) paper 208.
- Limberg, L. (1998a). Att söka information för att lära. En studie av samspel mellan informationsökning och lärande. Göteborg, VALFRID. (Avhandling vid institutionen för biblioteks- och informationsvetenskap vid Göteborgs Universitet.
- Limberg, L. (1998b). Three conceptions of information-seeking and use. In exploring the contexts of information behaviour. Proceeding of the Second international conference on research in information needs, seeking and use in different contexts. 13/14 August 1998. Sheffield, UK. Edited by T.D Wilson and D.K. Allen. London, Taylor Graham, P.116-135.
- Mann, T. (1993). Library research models: A guide to classification, cataloguing and computers. New York: Oxford University Press.
- Majid, S., & Ai, T.T. (2002). Usage of information resources by computer engineering students: a case study of Nanyang Technology University, Singapore. *Online Information Review* 26 (5), 318-325.
- Mellon, C.A. (1986). Library anxiety: A grounded theory and its development. Available at <http://www.library.arizona.edu/users/buchwaln/undergraduate.html> (access on 10th February, 2006).
- Mittermeyer, D. (2003). Information literacy: study of incoming first year undergraduates in Quebec. Paper presented at the Conference of Rectors and Principals of Quebec, Universities, Montréal, available at http://www.creug.ca/documents/bibl/formation/studies_Ang.pdf (access on 10th February, 2006).
- Ojedokun, A.A. (2001). Internet access and usage by students of the University of Botswana. *African Journal of Archive and Information studies* 11 (2), 97- 107.
- Ojedokun, A.A., & Owolabi, C. (2003). Internet access competence and the use of the Internet for teaching and research activities by Universities of Botswana academic staff. *African Journal of Archives and Information Science* 13 (1), 43- 53.
- Osiobe, S.A. (1998). Information-seeking behaviour. *International Library Review* 20 (3), 337-346.
- Seamans, N.H. (2001). Information literacy: a study of freshman student's perceptions, with recommendations. PhD thesis, Virginia Polytechnic Institute and State University. Available at: <http://www.scholar.lib.vt.edu/theses/available/etd-05142001-104550/unrestricted/seamans.pdf> (access 10 February, 2006).
- Ssendikadiwa, E.N.N. (1996). Evaluation of library-use instruction programs first year students in Makerere University Kampala-Uganda. Unpublished Project Report.
- Shera, J.H. (1972). The foundation of education for librarianship. New York: John Wiley & Sons, p.164.
- Smart, J.C. (2000). Academic disciplines: Holland's theory of the study of college students and faculty. Nashville: Vanderbilt University Press.
- Sonnenwald, D.H. & Wildermuth, B.M. (2001). Investigating information seeking behaviour using the concept of information horizons. ALISE Methodology Paper Competition. University of North Carolina, Chapel Hill.
- Taylor, R. (1968). Question-negotiation and information-seeking in libraries. *College and Research Libraries* 29, 178-194.
- Taylor, D.C. (1990). Undergraduates' use of periodicals: Implication for libraries reference work. *Reference Librarian*, 27/28, pp 51-65.
- Taylor, R.S. (1991). Information use environment. In Brenda Dervin & Melvin J. Voigt (Eds). Progress in communication sciences. Norwood, NJ: Ablex 10, 217- 225.
- Thorsteindottir, G. (2001). Information-seeking behaviour of distance learning students. *Information Research* 6(2). Available at: <http://InformationR.net/ir/6-2/ws7.html> (access on February 10, 2006).
- Uttor, J. (1999). The role of law libraries in a democratic culture. A paper presented at The 1999 NLA National Conference and AGM. Aug. 15th-20th.
- Watson-Bone, R. (1994). The information needs and habits of humanities scholars. RQ, 203-216.
- Wei, W. (1995). Rethinking science library services: a user study at the University of California, Santa Cruz. *Science and Technology Libraries* 15(3), 17-33.
- Weissinger, T. (2005). Information as a value concept: Reconciling theory and practice. *Library Philosophy and Practice* 8 (1), 1-13.
- Witemire, E. (1996). College students experience questionnaire. Retrieved from <http://www.findarticles.com>. on 10/01/2006.
- Whitmire, E. (2001). A longitudinal study of undergraduates' academic library experiences. *The Journal of Academic Librarianship* 27 (5), 379-385.

- Whitemire, E. (2002). Discipline differences and undergraduates' information-seeking behaviour. *Journal of the American Society for Information Science and Technology* 53 (8), 631-638.
- Whitemire, E. (2003). Epistemological beliefs and the information-seeking behaviour of undergraduate. *Library and Information Science Research* 25, 127-142.
- Wilson, T.D. (1997a). Information behaviour. An interdisciplinary perspective. In P. Vakkari, R. Savolainen & B. Dervin (Eds) *Information seeking in context of. Proceeding of an international conference on research in information needs, seeking and use in different contexts* 14-15, August, 1996, Tampere, Finland. London: Taylor Graham.
- Wilson, T.D. (1997b). Information behaviour: an inter-disciplinary perspective. *Information Processing & Management* 33(40), 551-572.
- Wiklund, G. (1998). Information as a social and intellectual capital in the research career: a gender perspective. *Information Research* 4(2), 23-34.
- Wimberley, S.E. Jr & Jones, W.G (1989). Patterns of information-seeking in the humanities. *College and Research Libraries*, 50, 638-645.
- Wright, M. and Guy, L. (1997). where do I find it and what do I do with it: Practical problem-solving in the data library, at http://dphs.dacc.wisc.edu/types/data_reference.html, date retrieved 10th February, 2006
- Xie, H. (2000). Shifts of interactive intentions and information-seeking strategies in interactive information retrieval. *Journal of the American Society for Information Science*. 51(10), 841-857.
- Zondi, L.E. (1992). Library use skills and information-seeking patterns of first year students at the University of Zululand, South Africa. *South African Journal of Library and Information Science* 60(4) pp 204-208.